

AMENDMENT TO THE CLAIMS:

1-8. (Cancelled)

9. (Original) A current sensor, comprising:

a magnetic core having at least a first layer of material having a relatively high magnetic permeability and at least a second layer of material having a relatively low magnetic permeability abutting said first layer of material;

wherein said core has a profile with at least one opening therethrough for accepting a current carrying conductor;

wherein said profile is selected from the group consisting of substantially O shaped, substantially C shaped and substantially figure-eight shaped; and

a signal generator that provides an output signal representative of the magnetic flux associated with said current carrying conductor.

10. (Original) The current sensor of claim 9, wherein:

said profile is substantially O shaped with at least one leg;

wherein said signal generator is at least one secondary winding arranged about said leg; and

wherein said secondary winding comprises a bobbin having first and second bobbin ends and wire turns arranged on said bobbin.

11. (Original) The current sensor of claim 9, wherein:

said profile is substantially C shaped;

wherein said core comprises spaced opposed gap faces to define an air gap therebetween; and

wherein said signal generator is a magnetic flux sensor arranged within said air gap.

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12. (Original) The current sensor of claim 9, wherein:
said profile is substantially figure-eight shaped;
wherein said core comprises spaced opposed gap faces in the central leg of said figure-eight shape to define an air gap therebetween; and
wherein said signal generator is a magnetic flux sensor arranged within said air gap.

13. (Original) The current sensor of claim 9, wherein;
said first and second layers of material are selected from the group consisting of a NiFe alloy having greater than about 50% Ni, a NiFe alloy having about 80% Ni, a Co-based amorphous metallic alloy, a CoFe alloy, a CoFe-V alloy, a NiFe alloy having no greater than about 50% Ni, a NiFe alloy having about 50% Ni, an Fe-base amorphous metallic alloy, and a SiFe alloy.

14. (Original) The current sensor of claim 9, wherein;
said first layer of material has about 10% more Ni than said second layer of material.

15. (Original) The current sensor of claim 9, wherein;
said first layer of material has about 20% more Ni than said second layer of material.

16. (Original) The current sensor of claim 9, wherein;
said first layer of material has about 30% more Ni than said second layer of material.

17-41. (Canceled)

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